

**Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services**

STATEMENT OF BASIS

**Unit 1291 – Fluidized Catalytic Cracking Unit
Unit 301 – Boilers Unit
Alliance Refinery
ConocoPhillips Company
Belle Chasse, Plaquemines Parish, Louisiana
Agency Interest Number: 2418
Activity Number: PER20080001
Draft Permit No. 1810-V3**

I. APPLICANT:

Company:

ConocoPhillips Company
P.O. Box 176, Belle Chasse, LA 70037

Facility:

Alliance Refinery
15551 Hwy 23, Belle Chasse, Plaquemines Parish, Louisiana
Approximate UTM coordinates are 211.51 kilometers East and 3,286.84 kilometers North, Zone 16

II. FACILITY AND CURRENT PERMIT STATUS:

ConocoPhillips Company owns and operates the Alliance Refinery, a petroleum refinery located in Belle Chasse, Louisiana. Gulf Oil Company built the refinery in 1970. BP Oil Company owned Alliance Refinery from 1985 until Tosco Corporation (Tosco) purchased it in September 2000. Tosco later became a wholly owned subsidiary of Phillips Petroleum Company on September 17, 2001. On August 30, 2002, Phillips Petroleum Company, including its subsidiary Tosco Corporation, completed a merger with Conoco Inc. to form ConocoPhillips Company. On January 1, 2003, the owner and operator of the Alliance Refinery formally changed from Tosco to ConocoPhillips Company.

Alliance Refinery produces a wide range of petroleum products from crude oil, such as motor gasoline, jet fuel, diesel fuel, LPG, carbon black feedstock, propane, and coke. It

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also produces by-product elemental sulfur and petrochemicals such as benzene, toluene, and xylene. The plant is covered by Standard Industrial Classification (SIC) 2911.

The 1291 Fluidized Catalytic Cracking Unit (FCCU) converts gas oils into gasoline by splitting long-chain hydrocarbons under low pressure, high temperature conditions using a fluidized bed catalytic process. Processing sections of the unit include the cracking section, fractionator section, and the recovery gas section. The unit produces the following products:

Fractionator Section - decanted oil, light catalytic gas oil, and lower boiling point hydrocarbons.

Recovery Gas Section - C₂ and lighter hydrocarbons, Alkylation Unit feed, light and heavy catalytic gasolines.

In the cracking section, the gas oil feed comes in contact with the fluidized catalyst. The overheads from the cracking section are sent to the fractionator section, which separates the stream into the components listed above. After contacting the gas oil, the hot catalyst becomes coated with coke. Catalyst is then circulated in the regenerator with air, and the coke is partially burned off. The FCCU vent from the catalyst regenerator, Emission Point No. 1291-D-1, is subject to PM and CO standards of New Source Performance Standards, 40 CFR 60, Subpart J - Standards of Performance for Petroleum Refineries. After undergoing three stages of particulate removal, the vent is piped to another unit, the 301-Boilers Unit, where it is combusted in the CO boilers. The CO Boilers serve as CO control devices.

The recovery section processes liquid and vapor from the fractionator overhead jointly with butane and lighter feeds from the 891-Delayed Coking Unit. In the recovery section C₃ - C₅ hydrocarbons are separated and sent to 491-HF Alkylation Unit. The sour fuel gas system in Unit 1291 recovers C₂ and lighter hydrocarbons for use as refinery fuel gas. The gasoline splitter distills the depentanized gasoline into heavy and light components.

The 301-Boilers Unit generates the steam used throughout the refinery for powering rotating equipment, providing process heat, and for fire protection. Unit air emissions are from two CO boilers fired by the FCCU regenerator flue gas supplemented with refinery fuel gas, and one supplemental boiler fired by refinery fuel gas. Other emissions result from fugitive VOC from the boiler unit piping system.

Several Part 70 and PSD permits addressing portions of the facility have already been issued. These include:

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Permit Number	Units or Sources	Unit Name	Date Issued
PSD-LA-75(M-2)	Unit 301	Boilers	10/13/87
PSD-LA-624	Source 301-B-3	Supplemental Boiler	09/16/98
2593-V1	Unit 293	Gulfining Unit	04/11/07
2113-V1	Unit 292	Diesel Hydrotreater Unit	09/10/07
2513-V4	Unit 412	Offsites	12/07/05
2776-V1	Unit 7591	Merox Treater Unit	01/03/08
2511-V2	Unit 891	Delayed Coking Unit	11/16/05
2840-V1	Unit 294	Low Sulfur Gasoline Unit	08/03/07
PSD-LA-696	Unit 294	Low Sulfur Gasoline Unit	10/03/03
2512-V1	Unit 491 & Unit 6191	HF Alkylation & Light Ends Recovery Unit	10/08/03
2778-V1	Unit 303	Utilities	03/26/09
2774-V2	Unit 591/592	Sulfur Recovery Unit	09/04/07
1810-V2 AA	Unit 1291/301	Fluidized Catalytic Cracking Unit/CO Boilers	01/30/07
1870-V0	Unit 308W	Wastewater Treatment Unit	08/23/05
2313-V1	Unit 406	Marine Loading and Transfer Operations	02/28/08
2180-V0	Unit 191/7991	Crude and Saturate Gas Unit	04/25/06
2779-V1	Unit 308F	Flares Unit	09/04/07
2775-V1	Units 291/1391/1791/1792	Naphfining, Catalytic Reforming, Aromatic Extraction, and Thermal Hydrodealkylation Units	10/01/08

III. PROPOSED PERMIT / PROJECT INFORMATION:

Permit Application Submittal Information

ConocoPhillips Company submitted an application and Emission Inventory Questionnaire (EIQ) dated January 21, 2008, as well as additional information dated February 5, 2009, and April 23, 2009, requesting a Part 70 permit modification. ConocoPhillips Company submitted an application and Emission Inventory Questionnaire (EIQ) dated December 15, 2008, requesting a Part 70 permit renewal/modification.

Project description

ConocoPhillips Company proposes the following changes:

- Incorporate requirements mandated by the Consent Decree for the FCCU, regenerators, and Carbon Monoxide (CO) Boilers. The Consent Decree

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established emission limits for CO for the FCCU, their regenerators, and the associated CO boilers which are not related to the New Source Performance Standards (NSPS).

- Permit the FCC Regenerator Vent, Emission Point No. 301-D-3, for emissions from Start-Ups and Shutdowns.
- Incorporate modifications from the application dated December 15, 2008, into this permit. The changes include updating combustion emission speciation based on factors from API publication 348 and incorporating specific conditions for the NO_x reduction from the Ultra Low NO_x Burners installed on the FCCU Light/Heavy Feed Heater, Emission Point No. 1291-H-2/3.
- Renew the Part 70 Operating Permit.

Permitted Air Emissions

Estimated emissions in tons per year are as follows:

<u>Pollutant</u>	<u>Before</u>	<u>After</u>	<u>Change</u>
PM ₁₀	440.67	441.63	+ 0.96
SO ₂	3,700.91	3709.68	+ 8.77
NO _x	1,370.34	1371.37	+ 1.03
CO	44.27	511.17	+466.90 ¹
VOC*	179.52	180.98	+ 1.46
Lead	-	0.13	+ 0.13
Other**	223.76	271.645	+ 47.885

¹The increase in CO is due to permitting of existing Startup and Shutdown emissions. There are no physical modifications or change in operation.

***VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs) in TPY:**

<u>Pollutant</u>	<u>Before</u>	<u>After</u>	<u>Change</u>
1,3-Butadiene	0.03	0.028	-0.002
2,2,4-Trimethylpentane	0.09	0.092	+0.002
Acetaldehyde	-	0.451	+0.451

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***VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs) in TPY:**

Pollutant	Before	After	Change
Acrolein	-	0.173	+0.173
Benzene	0.41	1.031	+0.621
Biphenyl	0.03	0.034	+0.004
Carbon disulfide	-	0.014	+0.014
Cresol	< 0.01	0.002	+0.002
Cumene	0.07	0.066	-0.004
Ethyl benzene	0.45	0.599	+0.149
Formaldehyde	-	1.208	+1.208
Hydrogen Cyanide	-	0.572	+0.572
Naphthalene	0.29	0.320	+0.030
PAH	-	0.002	+0.002
Phenol	-	0.059	+0.059
Toluene	1.28	2.592	+1.312
Xylene (mixed isomers)	2.32	2.619	+0.299
n-Hexane	0.44	0.434	-0.006
Total TAPs	5.41	10.296	+4.886
Other VOCs	174.11	170.684	-3.426

****NON-VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs):**

Pollutant	Before	After	Change
Antimony (and compounds)	0.36	0.019	- 0.341
Arsenic (and compounds)	-	0.017	+ 0.017
Barium (and compounds)	-	0.099	+ 0.099
Beryllium	-	0.002	+ 0.002
Cadmium (and compounds)	-	0.026	+ 0.026
Cobalt Compounds	-	0.018	+ 0.018
Chromium (and compounds)	-	0.077	+ 0.077
Copper (and compounds)	< 0.01	0.072	+ 0.072
Hydrochloric Acid	-	46.870	+46.870

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****NON-VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs):**

Pollutant	Before	After	Change
Manganese (and compounds)	-	0.084	+ 0.084
Mercury (and compounds)	-	0.010	+ 0.010
Nickel (and compounds)	0.02	0.201	+ 0.181
Selenium (and compounds)	-	0.065	+ 0.065
Sulfuric acid	223.38	223.950	+ 0.570
Zinc (and compounds)	-	0.135	+ 0.135
Total	223.76	271.645	+47.885

Prevention of Significant Deterioration Applicability

These units are not being physically modified; therefore, PSD does not apply

This application was reviewed for compliance with the Part 70 operating permit program. It was also reviewed for compliance with Louisiana Air Quality Regulations, National Emission Standards for Hazardous Air Pollutants (NESHAP), and New Source Performance Standards (NSPS). Prevention of Significant Deterioration (PSD) does not apply.

MACT requirements

ConocoPhillips meets MACT requirements by complying with the following:

- Louisiana Refinery MACT Determination for the 1291 and 301 fugitives
- The FCCU Process Vent, Emission Point No. 1291-D-1, shall be equipped with two-stage, high efficiency cyclones and sent through a high efficiency third stage separator, followed by a fourth stage catalyst fines recovery cyclone for about 85% particulate removal. The flue gas shall then be routed to the 301-Boilers Unit, where the two CO boilers, 301-B-2A and 301-B-2B, shall combust all of the flue gas produced by the Unit 1291 catalyst regenerator and discharging through vent 1291-D-1.
- CO Boilers, Emission Points 301-B-2A and 301-B-2B, shall operate as final control device for control of emissions from the FCCU Process Vent, Emission Point 1291-D-1

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Air Modeling Analysis

Dispersion Model(s) Used: ISCST3

Pollutant	Time Period	Calculated Maximum Ground Level Concentration	Louisiana Air Quality Standard (NAAQS)
NO _x	Annual	20.56 µg/m ³	(100 µg/m ³)
	3-hour	458.30 µg/m ³	(1300 µg/m ³)
SO ₂	24-hour	264.25 µg/m ³	(365 µg/m ³)
	Annual	25.31 µg/m ³	(80 µg/m ³)

The dispersion model was run for the Clean Fuels project. The screening model results for SO₂ were added to the Clean Fuels results since the 2005 flare study resulted in a significant increase of SO₂ emission estimates.

Impact on air quality from Unit 1291/301 will be below the National Ambient Air Quality Standards (NAAQS) and the Louisiana Ambient Air Standards (AAS) beyond industrial property.

General Condition XVII Activities

The facility will comply with the applicable requirements of General Condition XVII of the Louisiana Air Emission Permit General Conditions in the Title V Permit. For a list of approved General Condition XVII Activities, refer to Section VIII of the draft Part 70 permit. These releases are small and will have an insignificant impact on air quality.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to Section IX of the draft Part 70 permit.

IV. Permit Shields

A permit shield was not requested.

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V. Periodic Monitoring

Per New Source Performance Standards, Subpart J, the facility operates a continuous emission monitor and recorder on the refinery fuel gas system for H₂S concentration. Per LAC 33:III.1511, the facility operates a continuous emission monitor and recorder to monitor SO₂ emissions from the CO Boilers. Per New Source Performance Standards, Subpart J, the facility operates a continuous emission monitor and recorder to monitor opacity for the CO Boilers. Per New Source Performance Standards, Subpart Db, the facility operates a continuous emission monitor and recorder to monitor NO_x emissions from the Supplemental Boiler. Per the Consent Decree, the facility operates a continuous emission monitor and recorder to monitor NO_x emissions from the FCCU Light/Heavy Feed Heater, Emission Point No. 1291-H-2/3. Fugitive emissions must be monitored according to the provisions of Louisiana Refinery MACT.

VI. Applicability and Exemptions of Selected Subject Items

Regulatory applicability, standards, monitoring, reporting and recordkeeping requirements are provided in the Facility Specific Requirements Section of the draft permit. The table below summarizes highlights of the regulatory applicability for each emission point.

Source ID No.:	Requirement	Applicability
Facility – Unit 1291/301 Fluidized Catalytic Cracking/Boilers Unit	40 CFR 61.340 Subpart FF– National Emission Standard for Benzene Waste Operations.	Refinery has > 10 Mg/yr benzene from waste and must meet control, reporting, and recordkeeping requirements. (See Title V Permit, Unit 308W, Wastewater Treatment Unit.)
	LAC 33:III.2141 – Refinery Process Unit Turnarounds	VOC emissions from petroleum refinery process unit turnarounds shall be controlled by pumping liquid contents to storage and depressurizing the processing units to ≤ 5 psig before venting to the atmosphere. During depressurization, the vapors shall be controlled by (a) one of the applicable methods specified in LAC 33:III.2115.A, B, and F or (b) alternate controls.
RLP 10 – 1291-D-1 FCCU Process Vent	LAC 33:III.1311.D – Emission Standards for Particulate Matter Including Fluid Catalytic Cracking Units	CO Boilers are control devices for vent emissions. Boiler emissions shall not exceed 30% average opacity except for one 6 minute period in any 60 consecutive minutes. See Boilers 301-B-2A and 301-B-2B.

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Source ID No.:	Requirement	Applicability
FUG 7 – 1291-FF Unit Fugitives for FCC Unit FUG 8 – 301-FF Unit Fugitives for CO Boilers	LA MACT Determination for Refinery Equipment Leaks	Minimize emissions through LDAR program from equipment in VOTAP service such as pumps, compressors, Pressure Relief Devices, instrumentation systems, sampling connections, open-ended valves or lines, valves, flanges and other connectors, bottoms receivers, surge control vessels, and control devices or systems which operate > 300 hrs/yr.
EQT 67 – 1291-H-2/3 FCCU Light/Heavy Feed Heater	40 CFR 60.100 Subpart J – Standards of Performance for Petroleum Refineries	Fuel gas shall not contain >0.1 gr/dscf of H ₂ S.
EQT 68 – 1291-T-FOA Fuel Oil Additive-31 Storage Vessel	40 CFR 60.110b Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984	DOES NOT APPLY. Tank was constructed prior to 7/23/84.
EQT 69 – 301-B-2A CO Boiler EQT 70 – 301-B-2B CO Boiler	LAC 33:III.1503.C – Emission Standard for Sulfur Dioxide	Discharge gases shall not exceed 2000 ppmv for 3-hr. average.
EQT 69 – 301-B-2A CO Boiler EQT 70 – 301-B-2B CO Boiler	40 CFR 60 Subpart J, Standards of Performance for Petroleum Refineries	Comply with PM, opacity, and CO standards: § 60.102(a)(1), PM (E from R _c); § 60.102(a)(2), PM (opacity); § 60.103(a), CO
EQT 69 – 301-B-2A CO Boiler EQT 70 – 301-B-2B CO Boiler	LAC 33:III.1511.C Emission Standards for Sulfur Dioxide	Alliance Refinery performs an alternative SO _x monitoring method for the CO boilers per LAC 33:III.1511.C. H ₂ S in refinery fuel by CEM + S in FCCU feed (3 times per week).
EQT 69 – 301-B-2A CO Boiler EQT 70 – 301-B-2B CO Boiler	Emission Standards for Carbon Monoxide LAC 33:III.1705	Carbon monoxide waste stream from catalyst regeneration must be burned in direct flame afterburner or boiler. CO Boilers are final control device for FCCU vent, Emission Point No. 1291-D-1.
EQT 71 – 301-B-3 Supplemental Boiler	40 CFR 60.100 Subpart J – Standards of Performance for Petroleum Refineries	Fuel gas shall not contain >0.1 gr/dscf of H ₂ S.
EQT 71 – 301-B-3 Supplemental Boiler	40 CFR 60.40b Subparts Db - Standards of Performance for Industrial – Commercial – Institutional Steam Generating Units	Steam generating units for which construction, modification, or reconstruction commenced after June 19, 1984 and that have heat input capacities >100 million BTU/hr shall comply with the PM and NO _x standards given in the regulation.

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VII. Streamlined Requirements

Unit or Plant Site	Programs Being Streamlined	Stream Applicability	Overall Most Stringent Program
1291-Fluidized Catalytic Cracking Unit	LAC 33:III.Chapter 51, LA MACT for Refineries	≥ 5% VOTAP (Class I + II)	LA MACT for Refineries
	40 CFR 63, Subpart CC, NESHAP for Petroleum Refineries	≥ 5% OHAP	
	40 CFR 60, Subpart GGG, NSPS-VOC Equipment Leaks in Petroleum Refineries	≥ 10% VOC	
	LAC 33:III.2121, Louisiana Fugitive Emission Control	≥ 10% VOC	
301-Boilers Unit	LAC 33:III.Chapter 51, LA MACT for Refineries	≥ 5% VOTAP (Class I + II)	LA MACT for Refineries
	LAC 33:III.2121 - Louisiana Fugitive Emission Control	≥ 10% VOC	

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VIII. Glossary

Best Available Control Technologies (BACT) - An emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under this part which would be emitted from any proposed major stationary source or major modification which the administrative authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.

CAM - Compliance Assurance Monitoring rule – A federal air regulation under 40 CFR Part 64

Carbon Black - A black colloidal substance consisting wholly or principally of amorphous carbon and used to make pigments and ink.

Carbon Monoxide (CO) – (Carbon monoxide) a colorless, odorless gas produced by incomplete combustion of any carbonaceous (gasoline, natural gas, coal, oil, etc.) material.

Cooling Tower – A cooling system used in industry to cool hot water (by partial evaporation) before reusing it as a coolant.

Continuous Emission Monitoring System (CEMS) – The total combined equipment and systems required to continuously determine air contaminants and diluent gas concentrations and/or mass emission rate of a source effluent.

Cyclone – A control device that uses centrifugal force to separate particulate matter from the carrier gas stream.

Duct Burner – A device that combusts fuel and that is placed in the exhaust duct from another source (such as a stationary gas turbine, internal combustion engine, kiln, etc.) to allow the firing of additional fuel to heat the exhaust gases before the exhaust gases enter a steam generating unit.

Federally Enforceable Specific Condition - A federally enforceable specific condition written to limit the potential to Emit (PTE) of a source that is permanent, quantifiable, and practically enforceable. In order to meet these requirements, the draft permit containing the federally enforceable specific condition must be placed on public notice and include the following conditions:

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- A clear statement of the operational limitation or condition which limits the source's potential to emit;
- Recordkeeping requirements related to the operational limitation or condition;
- A requirement that these records be made available for inspection by LDEQ personnel;
- A requirement to report for the previous calendar year.

Grandfathered Status- Those facilities that were under actual construction or operation as of June 19, 1969, the signature date of the original Clean Air Act. These facilities are not required to obtain a permit. Facilities that are subject to Part 70 (Title V) requirements lose grandfathered status and must apply for a permit.

Heat Recovery Steam Generator (HRSG) – A steam generator that recovers exhaust heat from a gas turbine, and provides economizing and steam generation surfaces.

Hydrogen Sulfide (H₂S) - A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the action of acids on metallic sulfides, and is an important chemical reagent.

Maximum Achievable Control Technology (MACT) - The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

NESHAP - National Emission Standards for Hazardous Air Pollutants –Air emission standards for specific types of facilities, as outlined in 40 CFR Parts 61 through 63

Nitrogen Oxides (NO_x) - Compounds whose molecules consists of nitrogen and oxygen.

Nonattainment New Source Review (NNSR) - A New Source Review permitting program for major sources in geographic areas that do not meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. Nonattainment NSR is designed to ensure that emissions associated with new or modified sources will be regulated with the goal of improving ambient air quality.

NSPS - New Source Performance Standards – Air emission standards for specific types of facilities, as outlined in 40 CFR Part 60

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Organic Compound - Any compound of carbon and another element. Examples: Methane (CH₄), Ethane (C₂H₆), Carbon Disulfide (CS₂)

Part 70 Operating Permit- Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: ≥ 10 tons per year of any toxic air pollutant; ≥ 25 tons of total toxic air pollutants; and ≥ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM₁₀- Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) - The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Selective Catalytic Reduction (SCR) – A noncombustion control technology that destroys NO_x by injecting a reducing agent (e.g., ammonia) into the flue gas that, in the presence of a catalyst (e.g., vanadium, titanium, or zeolite), converts NO_x into molecular nitrogen and water.

Sulfur Dioxide (SO₂) – An oxide of sulfur.

TAP - Toxic Air Pollutant (LDEQ acronym for air pollutants regulated under LAC 33 Part III, Chapter 51, Tables 1 through 3).

Title V permit – See Part 70 Operating Permit.

“Top Down” approach – An approach which requires use of the most stringent control technology found to be technically feasible and appropriate based on environmental, energy, economic, and cost impacts.

Turbine – A rotary engine in which the kinetic energy of a moving fluid is converted into mechanical energy by causing a bladed rotor to rotate.

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Volatile Organic Compound (VOC) - Any organic compound which participates in atmospheric photochemical reactions; that is, any organic compound other than those which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.